DEPARTMENT OF PESTICIDE REGULATION
INNOVATIONS IN PEST MANAGEMENT:
REVEGETATION FOR WEED AND PEST CONTROL
INTERIM PROGRESS REPORT FOR 1998/1999

for

Friant Water Users Authority
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1.0 PRINCIPAL INVESTIGATOR

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2.0 PROJECT TITLE

**DEPARTMENT OF PESTICIDE REGULATION
INNOVATIONS IN PEST MANAGEMENT: REVEGETATION
FOR WEED AND PEST CONTROL INTERIM PROGRESS
REPORT FOR 1998/1999**

3.0 EXECUTIVE SUMMARY

The Friant Water Users Authority (FWUA), representing 25 water and irrigation districts, comprised of over 12,000 growers, formed an alliance with the California Department of Fish and Game, Tulare County Farm Bureau, the University of California, Cooperative Extension Service and the United States Bureau of Reclamation. The purpose of the partnership was to evaluate and implement the use of revegetation to both help reduce chemical herbicide and pesticide use and stabilize canal banks, levees and other typically barren facility and adjacent areas. This work was first initiated by FWUA in 1994, prior to the development of the partnership or Department of Pesticide Regulation (DPR) Grant Program. Establishment of the partnership alliance has helped to garner a broad-based support and interest in developing and expanding the process, both from research and demonstration aspects.

The project has developed from a single series of test plots at the beginning, to a broad-based partnership. The exciting findings have lead to the participation this year of several growers, a water district and another water authority. This grant period has been spent in additional field data collection, design and the development of these demonstration test plots and workshop planning. Work continued on the field vegetation sampling and data analyses. Date collation is now being initiated for statistical analyses.

3.0 EXECUTIVE SUMMARY (continued)

This past winter had even greater precipitation than previous years. This is a disadvantage to the establishment of native species when competition from exotic weed species is an issue. Similar to the seeding in 1994-95, some species planted in 1996-97 have not persisted, while others such as California brome are revealing they may be quite competitive with introduced species over time. All of the forbs were quite successful and subjectively, do appear to help minimize introduced weeds in the test plots.

Practical problems of unauthorized trespass, herbicide spraying and driving on the plots, either with vehicles or other farm equipment, were identified during the field evaluations. To minimize economic losses, these types of issues need to be addressed during the planning and implementation process.

4.0 GOALS/OBJECTIVES [1) met objective; 2) difficulties; 3) specific results & 4) pest mgmt. results (group formation, community involvement)]

1. Draft and distribute an analysis of long-term results which can be practically applied.

The intent of this goal ultimately is to draft scientific papers from this research that can be submitted to both peer reviewed journals and lay-publications, particularly agricultural and water-indirectly related publications.

This information will be based upon the long-term monitoring, which includes not only the qualitative and quantitative vegetation data, but also pest and management findings. Information is continuing to be collected for the long-term analysis which will be initiated upon completion of this years' data collation and analysis. The information from the past four years can be used to develop this analysis, including data prior to the DPR Grant.

Some of the management difficulties identified during previous evaluations continue to be an ongoing problem. These include plot exposure to herbicide leaching, wind blown or over-sprayed herbicides, fires caused by outside parties and trespass driving on plots by both vehicles and agricultural equipment. Vehicular and equipment trespass and spraying have resulted in the singular greatest amount of plot damages.

Fencing or signage appear to have limited effectiveness for protection of plantings. Signs of all kinds are widely ignored and destroyed. Installed fencing (wire and posts) were simply removed and stolen. Even sites between locked gates experienced damages, indicating that personnel with access were among those damaging the plots. New methods of managing these challenging issues are being evaluated.

2. Complete a quantitative and qualitative analysis of both years plots to incorporate into that analysis.

Growth of the mixes and individual species in the 1994-95 planted plots is continuing to indicate the best species for sandy loam soils. The mixes on the sandy loam soils continue to do well. Although a number of introduced alien species persist in these plots, the plots appear stable and continue to resist invasion by noxious weeds.

Recommendations for heavier soils will be more difficult to make, based on preliminary evidence, many of the perennial grasses are less successful on these types. However, the lupines in particular, all did well on these soils, as did yarrow. This was demonstrated by the initial success on the mix plots near the St. Johns River (Appendix 5.1). Unfortunately, most of this plot was destroyed by non-FWUA heavy equipment during pumping activities to control flood waters late last spring.

Insect monitoring results have shown that the plantings increased the diversity of insects, favoring beneficial rather than pest insects. Beneficial insects were also encountered well into adjacent vineyards, where they are not normally encountered (Jimenez, personal communication).

Field sampling for both qualitative and quantitative data were initiated in the spring and completed in the early summer. Numerous late spring and summer rainfall events interfered with sampling field work. Again, historically unprecedented high precipitation had an adverse effect on many plants and wildlife, and appeared to generate accelerated growth of introduced species.

Fine tuning of the statistical data from last year's analyses is ongoing. Appropriate methods of displaying this information to lay persons are being evaluated. Some data base errors in last year's analysis have been corrected relative to plant names and life form.

Preparation of data from this year's field work was initiated and the but computer analyses will begin shortly. These analyses and comparisons will be completed for the final report.

Collation of field data for the final report was initiated. A number of species which germinated in the original 1996/97 plantings did not persist. On the other hand, alkali sacaton seeded in the 1994/95 trials appear to have rebounded and some individuals are reproducing. In addition, saltgrass seeded at the Shafter Check test plots continued to spread and also produced seed this year. The establishment of saltgrass from seed is particularly noteworthy.

3. Establish five public outreach partner demonstration projects, as agreed upon with Bidart Brothers, Harlan Ranch, Sharp Ranches, Deer Creek and Tule River Authority and Arvin-Edison Water Storage District.

The five public outreach demonstration projects were planned (Appendix 5.2). Site visits, more than one in several cases, were made to each location. The size of each site and the goals for each demonstration site were established (Appendix 5.3). Seed mixes for each site have been researched and are in the process of being prepared. Known successful species will be used on upland sites.

New work will be initiated with wetland species for inside pond bank erosion control. Established ponds still experience significant wave wash erosion because vegetation does not seem to establish itself naturally in these areas. This creates a constant erosion and ongoing maintenance problem. Some planted grass or grass-like species appear to have the potential to solve this issue.

Species planned to be used in these demonstrations are listed in Appendix 5.4. These demonstrations will also be facing some practical evaluations. How can the fenceline be managed along the berms? Will the vegetation be adequate? In the orchard plantings, will we effectively be able to manage the growth so that it will not interfere with harvesting? On the levee inside banks, will the vegetation be able to adequately control erosion rapidly enough to ensure their own establishment?

4. Conduct a second public workshop to discuss results, applications and benefits.

This year, The Wildlife Society is holding a broad spectrum public workshop in December of this year, on "Practical Applications of Habitat and Wildlife Management on Farms and Ranches". It was decided that participation in this type of workshop would help generate additional opportunities to reach a wider audience with the findings of our studies. Plans are to present several papers at the workshop and we have a display of plant species which can be used for revegetation successfully and bird nest boxes. We have been helping to garner financial support, solicit growers and water districts to give papers, and also plan to provide a tour of some of the project sites available. The plans for this workshop are still in preparation at this time.

A copy of the distributed `Call for Papers' is included in Appendix 5.5. Papers to be presented are anticipated to be:

1. Practical political and policy parameters for habitat management partnerships in the Central Valley. (Dick Moss - presenter)

2. Native species trials for revegetation on canal levees. (Marcia Wolfe)
3. Revegetation for weed and pest control. (Julie Clark)

4. Conduct a second public workshop to discuss results, applications and benefits. (continued)

The poster session presentations are planned to include:

1. Bird nest boxes and raptor perches;
2. Native vegetation and march species and DPR revegetation for weed and pest control;
3. Field trip.

5. Conduct preliminary qualitative vegetation and insect monitoring and evaluation of the five new demonstration projects.

Plans have been initiated with Manuel Jimenez of the U.C. Davis Extension to ascertain the best approaches for evaluating the different demonstration projects relative to vegetation and insect population response.

6. Develop recommended planting guidelines for public distribution.

The drafting of planting guidelines has been initiated. The actual basic methodologies of seeding native species successfully have been established at this point. Appropriate interpretation and application of techniques is essential for seeding large areas. Use of mulch is critical during dry and average years for moisture control, and perhaps is equally important in wet years, to help minimize exotic weed establishment.

A critical element of seeding is site preparation. The guidelines being developed are generally for areas which have been clean farmed and which have a reduced weed seed bank. The techniques we have been evaluating will not be effective alone for habitat conversion, i.e., conversion from dense ruderal or non-native grassland. Habitat conversion will require seed bed manipulation and reduction through herbicide and disking, repeated fire or pre-irrigation and disking and/or herbicide application.

Upon completion of this years' analysis, development of planting guidelines can be developed. These guidelines are anticipated to differ from former agency recommendations.

Appendix 5.1. Successful forb establishment on mix plots near the St. Johns river.

Successful forb establishment on mix plots near the St. Johns River.

Appendix 5.2. **Article in "Waterline" on grant and cooperator partnerships**.

FRIANT
Waterline

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Published monthly (excepting one combined issue in December and January) by the Friant Water Users Authority, 854 North Harvard Avenue, Lindsay, California 93247-1715, as a review of issues and developments to inform those interested in water supplies on the east side of the southern San Joaquin Valley. To comment or ask any questions, please write or telephone us at (209) 562-6305, or contact your local irrigation district. This issue was printed March 13.

Kole M. Upton
Chairman of the Board

Richard M. Moss
General Manager

J. Randall McFarland
Editor

AROUND THE FRIANT DIVISION

■ TULARE IRRIGATION DISTRICT

Main Canal Lining Project Will Be Pursued

Tulare Irrigation District directors have decided to pursue a project aimed at reducing costly water conveyance losses by lining 9.7 miles of the district's Main Canal that are upstream of TID's service area.

Named recently as project engineer is the firm of CH_2M Hill. Design work and environmental studies are under way, said **Gerald C. Hill Jr.**, TID manager-secretary-engineer.

"We're working with the **Kaweah Delta Water Conservation District** to mitigate any problems," Hill said. "Unless there are unforeseen difficulties, the schedule calls for construction to begin in October and be ready for the 1999 irrigation season."

The board has agreed to funding the estimated $7 million project with a loan.

Rapidly escalating costs of the **Central Valley Project-Friant Division** water TID purchases from the **U.S. Bureau of Reclamation** are the project's motivation.

A study estimated TID's long term average conveyance losses in the unlined Main Canal amount to 17,300 acre feet annually, about 10% of TID's diverted supply.

"It's costing us about $300,000 a year under the current water rates," Hill said.

Along with Friant Division water, TID's Main Canal conveys water from the **St. Johns** and **Kaweah** rivers to the 60,000 acre district. ◻

■ FRIANT WATER USERS AUTHORITY

REVEGETATION FUNDING RENEWED

For the third straight year, the **Friant Water Users Authority** will receive grant funding to help pay for its creative pest control strategies.

The state's **Department of Pesticide Regulation** has awarded a $30,000 grant to the Authority to continue its "Revegetation for Weed and Pest Control" program along the **Friant-Kern Canal**.

Working with the Authority this year will be five outreach partners.

They include the **Arvin-Edison Water storage District** and **Bidart Brothers Farming** in Kern County, the **Deer Creek and Tule River Authority** and **Royal Farms and Sharp Ranches** in Tulare County, and **Harlan Ranch Company** in Fresno County.

The grant is the maximum allowable and is nearly three times larger than that received last year. It will permit the project to be enlarged to include outreach partners, said **Marcia H. Wolfe**, FWUA biologist. Wolfe has administered the revegetation trials for the past four years.

Quantitative vegetation sampling and analysis of all previously planted plots will be undertaken.

Developing vegetation management to reduce use of pesticides and herbicides for cost savings and environmental quality along the canal is a primary project purpose. Traditional bank maintenance has been replaced in test areas with an ecosystem of native perennial grasses, reducing weeds and rodent populations and minimizing erosion.

The program received the state agency's IPM Innovator Award last fall. ◻

■ FRESNO IRRIGATION DISTRICT

DELIVERIES MAY LAST 61/2 MONTHS

What is expected to be a 61/2 month water delivery season has been started by the **Fresno Irrigation District**.

Regular deliveries of surface water on a standard scheduled rotation basis will begin March 16. General Manager **Robert B. Mount** said, however, that FID filled its system March 5 "to accommodate those who can take water sooner."

Mount said that despite the ground being saturated by repeated February rainstorms, "the district must begin deliveries because of FID's limited storage at **Pine Flat Reservoir**." Expected above average **Kings River** runoff this spring could exceed FID's allotted storage and result in losses through flood releases or reallocation to other Kings River users.

If FID's deliveries extend into September, the 235,000 acre district expects to deliver 595,000 acre feet to its water users, compared with annual deliveries of 550,000 acre feet. FID also has a contract for 75,000 acre feet of Class 2 water annually from the **Central Valley Project's Friant Division**. ◻

■ SAN JOAQUIN RIVER PARKWAY

THREE MORE MILES OF TRAIL DEDICATED

Another three miles of the **San Joaquin River Parkway's Lewis S. Eaton Trail** have been dedicated.

The February 28 ceremony officially opened the $1 million trail segment northeast of **Woodward Park** in Fresno. The trail parallels the Friant Expressway overlooking the river.

Some $800,000 in grant funding along with $200,000 in local contributions made the project possible. The new trail is already being heavily used by walkers, joggers, bicyclists and equestrians.

The latest segment brings the parkway's completed length to five miles. Ultimately, the trail is to extend from **Friant Dam** to **Highway 99**.

Dave Kochler, executive director of the **San Joaquin River Parkway and Conservation Trust**, said, "The future of the parkway is very bright." ◻

■ PINE FLAT DAM

SPILLWAY GATE REPAIRS SCHEDULED

U.S. Army Corps of Engineers officials are moving ahead with plans for major repairs aimed at strengthening **Pine Flat Dam's** six spillway gates.

Each gate will be reinforced. The project is tentatively scheduled to begin next summer and would probably extend into February 1999. Inspections and evaluations were made of the gates' conditions following the July 1995 failure of a nearly identical spillway gate at Folsom Dam, east of Sacramento.

— Kings River Conservation District Newsletter

RIVER DATA

San Joaquin River watershed data recorded as of March 11 includes:

WATERSHED PRECIPITATION

Inches	1997-98 Including March 11	1996-97 Seasonal To Date	Season'l Avg. Through March
Huntington Lake	47.31	64.68	35.78
Bass Lake	36.98	55.77	34.79
Friant	17.63	19.30	12.23

SAN JOAQUIN RIVER FLOWS

Cubic Feet Per Second	March 11	Last Year
Calculated Natural Flow (Friant)	2,066	3,177
Actual Millerton Lake Inflow	3,906	4,169
Actual Flow At Friant	2,673	1,703

Article in "Waterline" on grant and cooperator partnerships.

Appendix 5.3. Summary of Demonstration Projects with Cooperators.

Appendix 5.3. Summary of demonstration projects with cooperators.

Cooperator	Project Location	Acreage	Goals
Arvin-Edison Water Storage District	Arvin-Edison Recharge Basin, Kern County	1.00	Wetland levee erosion control and slope stabilization
Bidart Farms	Shafter Check and Lerdo, Kern County	1.57	Fenceline weed and pest control
DCTRA - Deer Creek Lower Tule River Authority	Deer Creek, Tulare County	2.00	ROW seeding
Harlan Ranches	East of Clovis on Tollhouse Road, Fresno County	1.00	Evaluate native perennials for heavy soils.
Sharp Farms and Ranches	Tulare County	3.00	1. Stabilize sump banks for weed control. 2. Orchard cover crop for weed control.

Appendix 5.4. Proposed seed mixes for the demonstrator plots.

Appendix 5.4. Proposed seed mixes for the demonstrator plots.

SPECIES	COMMON NAME	SEED MIX PERCENT				
		Arvin-Edison Pond	**Bidart Farms**	**Deer Creek**	**Harlan Ranch**	**Sharp Ranch**
Achillea millefolium var. californicum	California white yarrow	4		4	6	6
Achnathersum (aka Oryzopsis) hymenoides var. paloma	Indian ricegrass		12		10	
Agrostis exarata	spike bentgrass		12	8		
Baccharis viminia	mulefat	3		4		
Bromus arizonicus/carinatus	Arizona or California brome	8	12	7	10	12
Castilleja exserta (Orthocarpus purpurescens)	purple owl's clover			4		12
Clarkia purpurea	purple Clarkia			4		6
Dichelostema capitulatum (aka pulchellum)	blue dicks, wild hyacinth			4	6	6
Distichlis stricta (spicata)	inland saltgrass	8		7		

SPECIES	COMMON NAME	SEED MIX PERCENT				
		Arvin-Edison Pond	**Bidart Farms**	**Deer Creek**	**Harlan Ranch**	**Sharp Ranch**
Eleocharis macrostachya (palustris)	spikerush	8				
Elymus glaucus ssp. glaucus	blue wildrye		8		7	
Elymus multisetus (aka Sitanion elymoides)	big squirreltail		8	6	7	
Eriogonum fasciculatum var. foliosum or polifolium	California flat top buckwheat			2	3	
Hordeum brachyantherum ssp. brachyantherum or californicum	meadow barley	9	12	8		1 1
Juncus effusus	common, pacific or soft rush	8				
Juncus xiphoides	flat bladed, iris or ivy leaved rush	9				
Krascheninnikoira lanata (aka Ceratoides)	winterfat				4	
Lasthenia california or crysostoma	dwarf goldfields			4	6	6

SPECIES	COMMON NAME	SEED MIX PERCENT				
		Arvin-Edison Pond	**Bidart Farms**	**Deer Creek**	**Harlan Ranch**	**Sharp Ranch**
Leymus triticoides (aka Elymus)	beardless or creeping wildrye	9	12	7		12
Lupinus bicolor	miniature or pygmy leaved lupine			4	6	6
Lupinus microcarpus var. densiflorus or hirizontalis	chick or golden lupine			4	6	6
Lupinus polyphyllus	blue pod, bush or Russell lupine	3		2		
Lupinus succulentus (aka sparsiflorus)	arroyo lupine				3	
Melica californica	California melic or onion grass				10	
Puccinellia nuttalliana or simplex	Nuttall's alkali grass		12	7	10	
Salix exigua	coyote or sandbar willow	3		2		
Scirpus acutus var. occidentalis	bulrush or common	9				

SPECIES	COMMON NAME	SEED MIX PERCENT				
		Arvin-Edison Pond	**Bidart Farms**	**Deer Creek**	**Harlan Ranch**	**Sharp Ranch**
	hardstem tule					
Solidago californica or rigida	California or stiff goldenrod			4	6	5
Sporobolus airoides	alkali sacaton	9	12	8		12
	TOTAL PERCENT	**100**	**100**	**100**	**100**	**100**

Appendix 5.5. "Practical Applications for Habitat and Wildlife Management on Farms and Ranches."

WORKSHOP PREVIEW AND CALL
for SPEAKERS, PAPERS and POSTERS

PRACTICAL APPLICATIONS FOR HABITAT AND WILDLIFE MANAGEMENT ON FARMS AND RANCHES

Co-Hosted by:
The Society for Ecological Restoration,
California Chapter (SERCAL)
and The San Joaquin Chapter of The Wildlife Society

DATE: December 8-9, 1998

PLACE: THE CONVENTION CENTER, Visalia, California

This 2 day workshop will examine practical, hands-on guidelines, suggestions and approaches for enhancing habitats and managing wildlife on farms and ranches, without significant disruptions to operations. The focus will be on practices which have already been implemented by growers, ranchers and water districts. On-going experimental programs will also be featured. Speakers should primarily include growers, consultants and ranchers who are currently implementing these practices. Agency personnel may also be included.

A panel of growers, ranchers, Farm Bureau and agency representatives will address issues and concerns about balancing agriculture and wildlife management practices. Methods for obtaining agency and regulatory cooperation, support and protection, while enhancing overall habitat for endangered and other species, will also be discussed. Trespass, liability, development of mutual trust and other complicated issues will hopefully be addressed.

If you would like to be a participant in the workshop program, please contact the **Workshop Chairperson** regarding submission of your abstract or poster presentation:

Karen J. Brown, Environmental Specialist III (209) 445-5386
California Department of Water Resources FAX (209) 445-5370
3374 East Shields Avenue, Room B19 karenb@water.ca.gov
Fresno, CA 93726-6990

Details of workshop specifics and registration information will be published in forthcoming issues of **SERCAL's** quarterly newsletter, the **San Joaquin Chapter's Valley Fever** and other publications.